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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,725	06/12/2007	Mitsuo Arima	112857-711	9416
29175 7590 12/10/2008 BELI, BOYD & LLOYD, LLP P. O. BOX 1135 CHICAGO, IL 60690				
EXAMINER				
GRAMLING, SEAN P				
ART UNIT		PAPER NUMBER		
2875				
MAIL DATE		DELIVERY MODE		
12/10/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/598,725

Applicant(s)

ARIMA ET AL.

Examiner

SEAN P. GRAMLING

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-31 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 14-31 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 08 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Amendment

Acknowledgment is made of Amendment filed September 8, 2008. Claims 14 and 18-26 are amended. Claims 27-31 are new. Claims 14-31 are pending.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, **the integrated molded article** recited in claim 27 must be shown or the feature canceled from the claim. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 14-17 and 25-26** are rejected under 35 U.S.C. 102 (b) as being anticipated by *Olczak* (US 2004/0109663).

3. Regarding claim 14, *Olczak* discloses an optical sheet 110 comprising a plurality of lens elements 116 provided successively in a row on one of principal faces of the optical sheet, wherein if a Z axis is taken in parallel to a normal line direction to said optical sheet and an X axis (represented by variable "r" in *Olczak*) is taken in a direction of the row of the cylindrical lens elements, a cross sectional shape in the XZ plane of each of the cylindrical lenses satisfies the following expression: $Z = X^2 / (R + \sqrt{R^2 - (1 + K)X^2}) + AX^4 + BX^5 + CX^6$ where R is the radius of curvature of a distal end vertex, K is a conic constant, and A, B, and C are aspheric coefficients (see Figures 2-3 and paragraphs [0022]-[0023]; note: *Olczak* defines variable "c" as 1/R, and when 1/R is substituted into Equation 1, the claimed equation is obtained. *Olczak* uses variables "d", "e" and "f" as the aspheric coefficients rather than A, B, and C. Also note that the

summation in paragraph [0023] and discussion in paragraph [0024] allows for the claimed polynomial).

4. Regarding claims 15-17, the variables satisfy the claimed numerical ranges (see paragraph [0023]).

5. Regarding claim 25, *Olczak* discloses a backlight comprising a light source¹⁰² for emitting illumination light; and an optical sheet 110 for raising the directivity of the illumination light emitted from the light source; the optical sheet comprising on the illumination light emission side thereof, a plurality of lens elements 116 provided successively in a row, wherein if a Z axis is taken in parallel to a normal line direction to said optical sheet and an X axis (represented by variable "r" in *Olczak*) is taken in a direction of the row of the cylindrical lens elements, a cross sectional shape in the XZ plane of each of the lens elements satisfies the following expression: $Z = X^2 / (R + \sqrt{R^2 - (1 + K)X^2}) + AX^4 + BX^5 + CX^6$ where R is the radius of curvature of a distal end vertex, K is a conic constant, and A, B, and C are aspheric coefficients (see Figures 2-3 and paragraphs [0022]-[0023]; note: *Olczak* defines variable "c" as 1/R, and when 1/R is substituted into Equation 1, the claimed equation is obtained. *Olczak* uses variables "d", "e" and "f" as the aspheric coefficients rather than A, B, and C. Also note that the summation in paragraph [0023] and discussion in paragraph [0024] allows for the claimed polynomial).

6. Regarding claim 26, *Olczak* discloses a liquid crystal display apparatus comprising a light source¹⁰² for emitting illumination light; an optical sheet 110 for raising the directivity of the illumination light emitted from the light source, the optical

sheet comprising on the illumination light emission side thereof, a plurality of lens elements 116 provided successively in a row; and a liquid crystal display panel (see paragraph [007]); wherein if a Z axis is taken in parallel to a normal line direction to said optical sheet and an X axis (represented by variable "r" in *Olczak*) is taken in a direction of the row of the lens elements, a cross sectional shape in the XZ plane of each of the lens elements satisfies the following expression: $Z = X^2 / (R + \sqrt{(R^2 - (1 + K)X^2)}) + AX^4 + BX^5 + CX^6$ where R is the radius of curvature of a distal end vertex, K is a conic constant, and A, B, and C are aspheric coefficients (see Figures 2-3 and paragraphs [0022]-[0023]; note: *Olczak* defines variable "c" as 1/R, and when 1/R is substituted into Equation 1, the claimed equation is obtained. *Olczak* uses variables "d", "e" and "f" as the aspheric coefficients rather than A, B, and C. Also note that the summation in paragraph [0023] and discussion in paragraph [0024] allows for the claimed polynomial).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 18-24 and 27-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Olczak* as applied to claim 14 above, and further in view of *Oda et al* (US 6,332,691).

9. Regarding claims 18, *Olczak* does not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the convex portions have a height equal to or greater than 0.20 micrometers and the density of the convex portions is between 70/mm² and 500/mm². However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific dimensions claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

10. Regarding claim 19, *Olczak* does not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the convex portions have a height equal to or greater than 0.20 micrometers and the average distance between the convex portions is between 50 and 120 micrometers. However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific dimensions claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made

to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

11. Regarding claim 20, *Olczak* does not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the convex portions are provided such that the cloudiness degree of the optical sheet is equal to or lower than 60 percent. However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific properties claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

12. Regarding claim 21, *Olczak* does not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the convex portions are provided such that the cloudiness degree of the optical sheet is equal to or lower than 20 percent. However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific properties claimed is well-known in the art, and is specifically taught in

Oda (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

13. Regarding claim 22, *Olczak* does not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the ten-point average roughness of the convex portions is within the range of 1 micrometer to 15 micrometers. However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific dimensions claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

14. Regarding claim 23, *Olczak* does not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the height of the convex portions is within the range of 1 micrometer to 7 micrometers. However, the formation of convex portions along the

surface of an optical sheet for a backlight unit with the specific dimensions claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

15. Regarding claim 24, *Olczak* does not specifically teach the formation of convex portions on the face of the optical sheet 110 opposite the face on which the lens elements 116 are formed, wherein the average inclination gradient of the face on the side on which the convex portions are provided is equal to or lower than 0.25. However, the formation of convex portions along the surface of an optical sheet for a backlight unit with the specific dimensions claimed is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

16. Regarding claim 27, the optical sheet in *Olczak* does not comprise convex portions provided on the principal face side opposite to the principal face on which the lens elements 116 are formed. However, the formation of convex portions along the surface of an optical sheet for a backlight unit is well-known in the art, and is specifically taught in *Oda* (see *Oda*, Figures 1, 2 and 10, and column 7, lines 57-58, column 11, lines 32-35, column 12, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form convex portions along the face of the optical sheet 110 opposite the face on which the cylindrical lens elements 116 are formed in *Olczak* as taught by *Oda* in order to provide an optical sheet with high brightness and high uniformity in brightness distribution (see *Oda*, column 3, lines 55-60).

17. Regarding claim 28, *Olczak* does not specifically disclose the optical sheet 110 include an integrated molded article formed by thermal transfer. However, molded articles for the manufacturing of optical sheets for backlights is well-known in the art and *Oda* specifically teaches that the optical sheet can be manufactured through a heat-pressed method using a mold (see *Oda*, column 11, lines 57-66). It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify the use of an integrated mold on the optical sheet 110 in *Olczak* for easy manufacturing of the convex portions of the optical sheet.

18. Regarding claim 29, *Olczak* teaches that the optical sheet 110 can be comprised of a transparent polymer (see paragraph [0032]), but does not specify a transparent thermoplastic resin. However, plastic resins are types of polymers and are well-known

in the art for use in prism sheets. It would have been obvious to one of ordinary skill in the art at the time the invention to specify that the optical sheet 110 in Olczak be comprised of thermoplastic resin since it has been held that the selection of a known material based on its suitability for the intended use for prior art parts does not make the claimed invention patentable over that prior art (In re Leshin, 125 USPQ 416).

19. Regarding claim 30, *Olczak* teaches that the optical sheet 110 can include at least one release agent (ultraviolet curable inorganic or organic materials, see paragraph [0032]), but does not specify that the weight be within the range of 0.02% to 0.04%. However, it would have been obvious to one of ordinary skill in the art to specify this range since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (In re Aller, 105 USPQ 233).

20. Regarding claim 31, *Olczak* teaches that the optical sheet 110 can include at least one ultraviolet absorbing agent (ultraviolet curable inorganic or organic materials, see paragraph [0032]), but does not specify that the weight be within the range of 0.02% to 0.04%. However, it would have been obvious to one of ordinary skill in the art to specify this range since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (In re Aller, 105 USPQ 233).

Response to Arguments

21. Applicant's arguments filed September 8, 2008 with respect to the rejection of the claims in the previous Office Action have been fully considered but they are not persuasive. Examiner respectfully disagrees with Applicant's contention that the Olczak reference does not disclose or suggest an XZ cross-section that is entirely paraboloidal or hyperboloidal. Examiner directs Applicant to at least Figures 2-3 (particularly to Figure 3), which clearly illustrates a cross sectional shape of the optical sheet 110 **taken in the XZ plane**, where a cross sectional shape of each of the lens elements 116 is taken in the XZ plane such that each lens element 116 is entirely paraboloidal and satisfies the claimed expression (see Figures 2-3 and paragraphs [0009]-[0010], [0022], [0025] and claim 1). While the particular expression may relate to a segment of the parabola, the disclosure clearly describes the three-dimensional nature of the prisms and Figure 3 clearly illustrates that each of the lens elements 116 have a cross section in the XZ plane that satisfies the claimed expression when taken over a width (the X direction) of the optical sheet (see paragraph [0025]). Moreover, claim 1 specifically recites a surface comprising a prism structure **characterized by a cross section** described by the claimed expression (see claim 1). Accordingly, the rejection of claims 14-17 and 25-26 under 35 U.S.C. 102 (b) as being anticipated by Olczak is maintained.

Conclusion

22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN P. GRAMLING whose telephone number is (571)272-9082. The examiner can normally be reached on MONDAY-FRIDAY 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (571) 272-2378. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sean P Gramling
Examiner
Art Unit 2875

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